

Volume I Number 2  
May 1998  
ISSN 1094-8848

SPECIAL ISSUE ON THE NORTHRIDGE EARTHQUAKE



BUREAU OF TRANSPORTATION STATISTICS UNITED STATES DEPARTMENT OF TRANSPORTATION

# JOURNAL OF TRANSPORTATION AND STATISTICS

## A Brief Overview of the Northridge Earthquake and Its Transportation Impacts

A magnitude 6.8 earthquake rocked the Los Angeles area on January 17, 1994. Centered on the Northridge community in the San Fernando Valley, the earthquake knocked out four freeways, caused the collapse of parking structures, damaged buildings, and ruptured numerous natural gas distribution lines. The interchange between the Golden State Freeway (I-5) and the Antelope Valley Freeway (SR-14) collapsed, severing California's main north-south artery and isolating the rapidly growing suburbs north of the San Gabriel Mountains. The Simi Valley Freeway (SR-118) failed in two places, affecting suburbs to the northwest of Los Angeles. The Santa Monica Freeway (I-10), which normally carries over 300,000 vehicles per day and is the main route between downtown and Los Angeles International Airport, also collapsed. (See map on page iv.)

The transportation system in Los Angeles demonstrated enormous resiliency following the earthquake. Most nonhighway transportation facilities were operational within two days, and alternatives were implemented within a week for the key broken links in the highway system. Alternatives included rerouting of traffic over parallel streets, institution of high occupancy vehicle (HOV) lanes on parts of the reroutes, and rapid expansion of commuter railroad service. For example, commuter service on the railroad that paralleled SR-14 accommodated a jump in patronage from 950 to 22,000 riders per day. Traffic was often diverted from broken links on the National Highway System (NHS) to local arteries not on the NHS.

Subsequent studies by Commuter Transportation Services, a not-for-profit organization that promotes ride sharing and transit use, found that one-half of all commuters in Los Angeles and 80% of commuters in the earthquake zone made some adjustment to their travel, but most changes were temporary. Adjustments were mainly to routes and time of departure. Many commuters stuck with the alternate routes on arteries paralleling the freeways that they “discovered” following the earthquake. One-quarter of the new commuter rail riders have continued to use this service.

Short-term changes in travel patterns were not entirely commuters' responses to disruptions in the transportation system. Many people stayed home for the week following the earthquake to clean up and arrange for repairs to personal property.

A significant number of parking structures, often overlooked as a component of the transportation system, failed. A spectacular example at a local shopping center received substantial media coverage during rescue operations. Another parking garage at the local state university was reduced to a modernistic sculpture.

Commerce was also affected by the earthquake. I-5 is the major north-south corridor of the Pacific Rim states, and was effectively severed for several days. Traffic between the Los Angeles-San Diego area and Northern California could use U.S. 101 without too much added circuitry, but traffic to Bakersfield and the agricultural portions of the southern San Joaquin Valley was diverted via San Luis Obispo or San Bernardino with much greater relative circuitry.

Twenty days after the earthquake, representatives of the Bureau of Transportation Statistics (BTS) delivered special tabulations of census data to assist local transportation planners. While delivering the data, BTS was able to observe the damage and the response of local agencies.

BTS recognized that the Northridge earthquake and its aftermath provided a natural laboratory to examine travel behavior, the reliability of the transportation system, and the impact of transportation disruptions on businesses and the regional economy. With BTS support, the University of California at Los Angeles, the University of California, Irvine, the University of Southern California, and California Polytechnic University, Pomona initiated studies of travel behavior and economic relationships revealed by responses to the earthquake. The studies also made significant methodological strides in the measurement of damage from natural disasters, especially in the identification of economic disruption caused by damage to the transportation system versus direct damage to business facilities versus home-based disruptions to the workforce. This issue presents the results of the BTS-sponsored research.

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